

Marketability and Feasibility of Chair-Side Gas Chromatography Mass Spectrometer for Dental Application

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Dental caries, commonly known as cavities, is the most common disease of childhood, but affects all ages. The first signs of dental caries (early lesions) can be seen before the cavitation is observed. If left untreated, the early lesions can progress to cavitation. Treatment provided at the early stages can prevent progression and avoid the traditional surgical/restorative treatment which does not prevent reoccurrence or stops progression of the disease. The challenge faced by dentists is the ability to accurately identify tooth sites at risk for lesion initiation and progression. Currently, no technology exists that has the ability to accurately assess a site and determine whether or not that surface will develop a lesion or if an existing lesion will progress towards cavitation. On-going research at the Oral Health Research Institute has shown that biofilm samples collected from caries active sites in children have distinguishably different metabolite signals when compared to caries-free sites. These signal profiles were determined using Gas Chromatography Mass Spectrometer (GCMS) analysis. The ability to provide such signature profiles during a typical dental examination may allow for early identification of surfaces and patients at risk and institution of preventative measures to be taken much sooner. In order to reach this stage of mass use of this technology for this specific application, diligent analysis of the possible market and customer of this signature product must be conducted. The three key populations surveyed and interviewed for the marketability and feasibility of this product were mass spectrometer experts and manufacturers, practicing dentists, and policy makers and individuals with expertise in dental insurance. Although the project is ongoing and results are inconclusive, these key informants will provide answers on whether or not a GCMS for this application is viable, the likelihood of dentists using the product aforementioned, cost structures of production and marketing, and key partner relationships with insurance companies. These findings will provide an initial indication of the success of this technology in a predetermined market, but it may also open unforeseen opportunities in other markets.